

Herniated lumbar disc: injection interventions for sciatica

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ABSTRACT

INTRODUCTION: Herniated lumbar disc is a displacement of disc material (nucleus pulposus or annulus fibrosus) beyond the intervertebral disc space. The highest prevalence is among people aged 30 to 50 years, with a male to female ratio of 2:1. **METHODS AND OUTCOMES:** We conducted a systematic overview, aiming to answer the following clinical question: What are the effects of injection interventions for clinical symptoms of sciatica relating to confirmed or suspected herniated lumbar disc? We searched: Medline, Embase, The Cochrane Library, and other important databases up to May 2014 (BMJ Clinical Evidence overviews are updated periodically; please check our website for the most up-to-date version of this overview). **RESULTS:** At this update, searching of electronic databases retrieved 320 studies. After deduplication and removal of conference abstracts, 240 records were screened for inclusion in the overview. Appraisal of titles and abstracts led to the exclusion of 171 studies and the further review of 69 full publications. Of the 69 full articles evaluated, four systematic reviews and one RCT were added at this update. We performed a GRADE evaluation for 13 PICO combinations. **CONCLUSIONS:** In this systematic overview, we categorised the efficacy for four interventions based on information about the effectiveness and safety of epidural corticosteroid injection (with or without local anaesthetic), epidural injection with local anaesthetic alone, nerve root block with corticosteroid injection (with or without local anaesthetic), and nerve root block with local anaesthetic injection alone.

QUESTIONS

What are the effects of injection interventions for clinical symptoms of sciatica relating to confirmed or suspected herniated lumbar disc? 4

INTERVENTIONS

INJECTIONS		Nerve root block with local anaesthetic alone		New . .
?? Unknown effectiveness		1	7	
Epidural corticosteroid injection (with or without local anaesthetic)	4	Covered elsewhere in Clinical Evidence Chronic low back pain Non-specific acute low back pain		
Epidural injection with local anaesthetic alone	New . .			
1	4			
Nerve root block with corticosteroid injection (with or without local anaesthetic)	New	14		

Key points

- Herniated lumbar disc is a displacement of disc material (nucleus pulposus or annulus fibrosus) beyond the intervertebral disc space.
The highest prevalence is among people aged 30 to 50 years, with a male to female ratio of 2:1.
- Previous *BMJ Clinical Evidence* [overviews on this topic](#) have evaluated the effectiveness of a broad range of interventions, including drug treatment and surgery. However, for this update we have focused on injection treatments as these are in widespread clinical use, particularly for patients with severe initial leg pain or significant persistent leg pain in the absence of neurological deficit, short of the threshold for surgery at 3 months.
- We evaluated evidence from RCTs and systematic reviews of RCTs on the effectiveness of epidural corticosteroid injection (with or without local anaesthetic), epidural injection with local anaesthetic alone, nerve root block with corticosteroid injection (with or without local anaesthetic), and nerve root block with local anaesthetic injection alone.
- We found several RCTs that assessed a range of different measures of symptom improvement and found inconsistent results, so we are unable to draw firm conclusions on effects of epidural injections of corticosteroids.
[Epidural corticosteroid injection \(with or without local anaesthetic\)](#) may be more effective at improving leg pain in the short term (up to 6 weeks) compared with no epidural injection, but may be no more effective in the longer term (approximately 6 weeks to 14 months) in people with clinical symptoms of sciatica relating to confirmed or suspected lumbar disc herniation.
Epidural corticosteroid injection (with or without local anaesthetic) may be no more effective in the longer term (over 5 weeks) at improving disability or functional outcomes, such as straight leg raising and lumbar flexion, compared with no epidural corticosteroid injection in people with clinical symptoms of sciatica relating to confirmed or suspected lumbar disc herniation.
We found no direct information from RCTs about [epidural injection with local anaesthetic alone](#) in the treatment of people with clinical symptoms of sciatica relating to confirmed or suspected lumbar herniated lumbar disc.
- We don't know whether [injection of corticosteroid as a nerve block](#), with or without local anaesthetic, is more effective than no nerve block at improving pain or need for surgery in people with clinical symptoms of sciatica relating to confirmed or suspected lumbar herniated lumbar disc.

We don't know whether [nerve root block with local anaesthetic alone](#) is more effective than no nerve root block at improving pain outcomes or need for surgery in people with sciatica relating to confirmed herniated lumbar disc. We only found one RCT evaluating this intervention.

- As in many areas of spinal practice, lack of high-quality clinical trials makes evidence-based clinical practice difficult. Many relevant trials have heterogeneous entry criteria and outcome measures.

Clinical context

GENERAL BACKGROUND

Lumbar disc herniation is a relatively common, painful, and disabling condition, but has a reasonably good outcome with expedient treatment. Most patients with severe symptoms, needing additional care than provided by their general practitioner, will improve on medication and with physiotherapy input. Patients with sciatica that is initially severe or persistent in the absence of neurological deficit may be good candidates for injection treatments. A small number of patients with persistent nerve root pain beyond 3 months from onset, progressive neurological deficit, or cauda equina syndrome are candidates for surgery.

FOCUS OF THE REVIEW

There is a reasonable evidence base surrounding the use of medication and also about the specific role of surgery in this condition. Injections have been in widespread clinical practice for many years, and yet there has been a general recognition that the evidence base does not support their clinical use, although there is evidence that injections may offer effective pain relief from sciatica in the short term. This is one area of medicine where the pragmatic clinical approach needs to be supported by relevant clinical evidence.

COMMENTS ON EVIDENCE

As in many areas of spinal practice, lack of high-quality clinical trials makes evidence-based clinical practice difficult. Many relevant trials have heterogeneous entry criteria and outcome measures. External validity may at times be a problem. Pragmatically, injection treatments are used to treat severe leg pain due to lumbar spinal nerve root involvement, especially when symptoms do not improve in the first 2 months and despite primary care treatments in the form of medication and physiotherapy. The primary outcome measures should be early relief of leg pain and improvement in function. This should be compared with other conservative interventions used in such presentations, and there should be long-term follow-up.

SEARCH AND APPRAISAL SUMMARY

The update literature search for this overview was carried out from the date of the last search, June 2010, to May 2014. A back search from 1966 was performed for the new options added to the scope at this update. For more information on the electronic databases searched and criteria applied during assessment of studies for potential relevance to the overview, please see the Methods section. Searching of electronic databases retrieved 320 studies. After deduplication and removal of conference abstracts, 240 records were screened for inclusion in the overview. Appraisal of titles and abstracts led to the exclusion of 171 studies and the further review of 69 full publications. Of the 69 full articles evaluated, four systematic reviews and one RCT were added at this update.

DEFINITION

Herniated lumbar disc is a displacement of disc material (nucleus pulposus or annulus fibrosus) beyond the intervertebral disc space.^[1] The diagnosis can be confirmed by radiological examination. However, MRI findings of herniated disc are not always accompanied by clinical symptoms.^[2] ^[3] This overview covers treatment of people with clinical symptoms of sciatica relating to confirmed or suspected disc herniation. It does not include treatment of people with spinal cord compression or people with cauda equina syndrome, which require emergency intervention. The management of non-specific acute low back pain and chronic low back pain are covered elsewhere in *BMJ Clinical Evidence*. **Injection interventions** We have focused on injection treatments for this update. Essentially, these injections involve the instillation of either local anaesthetic or corticosteroid, or both, into the region where the presumed inflammatory pathology due to the disc herniation is irritating the nerve root and producing leg pain, often referred to in the literature and by clinicians and patients as sciatica. Epidural injections can be administered by the lumbar, caudal, or transforaminal route. The lumbar or interlaminar route is typically performed at L3-L4 or L4-L5. The caudal route involves a needle being passed through the caudal membrane, and higher volumes of injection are instilled so as to reach the lumbosacral junction. Transforaminal epidural injection involves a needle being inserted through an oblique approach into the region of the intervertebral foramen and injecting around the dura. Selective nerve root block is a similar injection but, following contrast administration, the injection is essentially into the nerve root sleeve and extra-spinally rather than getting into the epidural space. Typically, these interventions are used early in the evolution of a disc herniation, either for severe initial leg pain or for persistent leg pain short of the threshold for surgery at approximately 3 months. In current clinical practice, they may be repeated providing the

first injection produced adequate pain relief, and depending on a variety of other patient-related factors, including the presence or absence of medical comorbidities.

INCIDENCE/ PREVALENCE	The prevalence of symptomatic herniated lumbar disc is about 1% to 3% in Finland and Italy, depending on age and sex. ^[4] The highest prevalence is among people aged 30 to 50 years, ^[5] with a male to female ratio of 2:1. ^[6] In people aged 25 to 55 years, about 95% of herniated discs occur at the lower lumbar spine (L4-L5 and L5-S1 level); disc herniation above this level is more common in people aged over 55 years. ^[7] ^[8]
AETIOLOGY/ RISK FACTORS	Radiographical evidence of disc herniation does not reliably predict low back pain in the future, or correlate with symptoms; 19% to 27% of people without symptoms have disc herniation on imaging. ^[2] ^[9] Risk factors for disc herniation include smoking (OR 1.7, 95% CI 1.0 to 2.5), weight-bearing sports (e.g., weight lifting, hammer throw), and certain work activities, such as repeated lifting. Driving a motor vehicle has been suggested to be a risk factor for disc herniation, although evidence is inconclusive (OR 1.7, 95% CI 0.2 to 2.7). ^[6] ^[10] ^[11]
PROGNOSIS	The natural history of disc herniation is difficult to determine because most people take some form of treatment for their back pain and a formal diagnosis is not always made. ^[6] Sequential MRIs have shown that the herniated portion of the disc tends to regress over time, with partial to complete resolution after 6 months in two-thirds of people. ^[12]
AIMS OF INTERVENTION	To relieve pain; increase mobility and function; improve quality of life; and minimise adverse effects of treatments.
OUTCOMES	Pain , including global symptom relief; functional improvement (measured by e.g., Roland Morris Disability Questionnaire; Oswestry Disability Index; Hannover Functional Ability Questionnaire), return to work; patient perception of improvement ; need for surgery ; quality of life ; adverse effects .
METHODS	Search strategy <i>BMJ Clinical Evidence</i> search and appraisal date May 2014. Databases used to identify studies for this systematic overview include: Medline 1966 to May 2014, Embase 1980 to May 2014, The Cochrane Database of Systematic Reviews 2014, issue 5 (1966 to date of issue), the Database of Abstracts of Reviews of Effects (DARE), and the Health Technology Assessment (HTA) database. Inclusion criteria Study design criteria for inclusion in this systematic overview were systematic reviews and RCTs published in English, at least single-blinded, and containing more than 20 individuals, of whom more than 80% were followed up. There was no minimum length of follow-up. We excluded all studies described as 'open', 'open label', or not blinded unless blinding was impossible. <i>BMJ Clinical Evidence</i> does not necessarily report every study found (e.g., every systematic review). Rather, we report the most recent, relevant, and comprehensive studies identified through an agreed process involving our evidence team, editorial team, and expert contributors. Evidence evaluation A systematic literature search was conducted by our evidence team, who then assessed titles and abstracts, and finally selected articles for full text appraisal against inclusion and exclusion criteria agreed <i>a priori</i> with our expert contributors. In consultation with the expert contributors, studies were selected for inclusion and all data relevant to this overview extracted into the benefits and harms section of the overview. In addition, information that did not meet our pre-defined criteria for inclusion in the benefits and harms section may have been reported in the 'Further information on studies' or 'Comment' section. Adverse effects All serious adverse effects, or those adverse effects reported as statistically significant, were included in the harms section of the overview. Pre-specified adverse effects identified as being clinically important were also reported, even if the results were not statistically significant. Although <i>BMJ Clinical Evidence</i> presents data on selected adverse effects reported in included studies, it is not meant to be, and cannot be, a comprehensive list of all adverse effects, contraindications, or interactions of included drugs or interventions. A reliable national or local drug database must be consulted for this information. Comment and Clinical guide sections In the Comment section of each intervention, our expert contributors may have provided additional comment and analysis of the evidence, which may include additional studies (over and above those identified via our systematic search) by way of background data or supporting information. As <i>BMJ Clinical Evidence</i> does not systematically search for studies reported in the Comment section, we cannot guarantee the completeness of the studies listed there or the robustness of methods. Our expert contributors add clinical context and interpretation to the Clinical guide sections where appropriate. Structural changes this update At this update, we have removed the following previously reported questions: What are the effects of drug treatments for herniated lumbar disc? What are the effects of non-drug treatments for herniated lumbar disc? What are the effects of surgery for herniated lumbar disc? Data and quality To aid readability of the numerical data in our overviews, we round many percentages to the nearest whole number. Readers should be aware of this when relating percentages to summary

statistics such as relative risks (RRs) and odds ratios (ORs). *BMJ Clinical Evidence* does not report all methodological details of included studies. Rather, it reports by exception any methodological issue or more general issue that may affect the weight a reader may put on an individual study, or the generalisability of the result. These issues may be reflected in the overall GRADE analysis. We have performed a GRADE evaluation of the quality of evidence for interventions included in this review (see table, p 21). The categorisation of the quality of the evidence (high, moderate, low, or very low) reflects the quality of evidence available for our chosen outcomes in our defined populations of interest. These categorisations are not necessarily a reflection of the overall methodological quality of any individual study, because the Clinical Evidence population and outcome of choice may represent only a small subset of the total outcomes reported, and population included, in any individual trial. For further details of how we perform the GRADE evaluation and the scoring system we use, please see our website (www.clinicalevidence.com).

QUESTION What are the effects of injection interventions for clinical symptoms of sciatica relating to confirmed or suspected herniated lumbar disc?

OPTION EPIDURAL CORTICOSTEROID INJECTION (WITH OR WITHOUT LOCAL ANAESTHETIC)

- For GRADE evaluation of interventions for Herniated lumbar disc: injection interventions for sciatica, see table, p 21 .
- We found several RCTs, which assessed a range of different measures of symptom improvement and found inconsistent results, so we are unable to draw any firm conclusions on the effects of epidural injections of corticosteroids.
- Epidural corticosteroid injection (with or without local anaesthetic) may be more effective at improving leg pain in the short term (up to 6 weeks) compared with no epidural injection, but may be no more effective in the longer term (approximately 6 weeks to 14 months) in people with clinical symptoms of sciatica relating to confirmed or suspected lumbar disc herniation.
- Epidural corticosteroid injection (with or without local anaesthetic) may be no more effective in the longer term (over 5 weeks) at improving disability or functional outcomes, such as straight leg raising and lumbar flexion, compared with no epidural corticosteroid injection in people with clinical symptoms of sciatica relating to confirmed or suspected lumbar disc herniation.

Benefits and harms

Epidural corticosteroid injection (with or without local anaesthetic) versus no epidural corticosteroid injection:






We found four systematic reviews assessing epidural corticosteroid injections in people with sciatica (nerve root pain/radicular pain) caused by confirmed or suspected lumbar disc herniation.^{[13] [14] [15] [16]} The first review (search date 1998, 4 RCTs, 332 people) performed a meta-analysis assessing patient perception of improvement, which we report below.^[13] The second systematic review (search date 2008, 2 RCTs, 80 people) of caudal epidural injections identified one additional RCT not included in the other reviews and did not include a meta-analysis, so we also report this RCT separately (see Further information on studies).^[14] The third systematic review (search date 2008, 3 RCTs, 437 people) of lumbar interlaminar epidural injections also did not include a meta-analysis. It included two RCTs identified by the first review but reported on different outcomes and included one further RCT in greater detail than in the other reviews, so we report all three RCTs separately.^[15] The fourth review (search date 2009, 12 RCTs) carried out a meta-analysis of epidural corticosteroid injections.^[16] However, the analysis included studies evaluating nerve root block injections, which are covered as a separate intervention in this overview. For this reason, we chose not to report results from the meta-analysis. The fourth review identified one additional RCT, which is reported below.^[17]

Pain

Epidural corticosteroid injection (with or without local anaesthetic) compared with no epidural corticosteroid injection
Epidural corticosteroid injection (with or without local anaesthetic) may be more effective at improving leg pain in the short term (up to 6 weeks) compared with no epidural injection, but may be no more effective in the longer term (approximately 6 weeks to 14 months) in people with clinical symptoms of sciatica relating to confirmed or suspected lumbar disc herniation (*low-quality evidence*).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Pain					
[14]	23 people with nerve root compromise	Proportion of people with improvement in back and leg pain (unspecified) , 4 weeks	Reported as significant in favour of corticosteroid injection	○○○	corticosteroid plus local anaesthetic

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Systematic review	Data from 1 RCT	with caudal corticosteroid injection of 25 mL triamcinolone acetate 80 mg with or without 0.5% procaine hydrochloride with placebo (25 mL saline injection) Absolute results not reported 2 caudal injections were given, the first after admission to the trial, and the second after 2 weeks	No further data reported		
[14] Systematic review	23 people with nerve root compromise Data from 1 RCT	Proportion of people with improvement in back and leg pain (unspecified) , 12 months with caudal corticosteroid injection of 25 mL triamcinolone acetate 80 mg with or without 0.5% procaine hydrochloride with placebo (25 mL saline injection) Absolute results not reported 2 caudal injections were given, the first after admission to the trial, and the second after 2 weeks	Reported as no significant difference between groups at 12 months No further data reported	↔	Not significant
[15] Systematic review	228 people with unilateral sciatica, possibly caused by disc herniation Data from 1 RCT	Proportion of people with improvement in leg pain (unspecified) measured by visual analogue scale (VAS) , 3 weeks with triamcinolone 80 mg plus 10 mL 0.25% bupivacaine with 2 mL normal saline Absolute results not reported Interlaminar epidural injection	Reported as no significant difference between groups No further data reported by review	↔	Not significant
[15] Systematic review	228 people with unilateral sciatica, possibly caused by disc herniation Data from 1 RCT	Proportion of people with improvement in leg pain (unspecified) measured by Likert scale , 3 weeks 61% with triamcinolone 80 mg plus 10 mL 0.25% bupivacaine 40% with 2 mL normal saline Absolute numbers not reported Interlaminar epidural injection	P <0.01	○○○	corticosteroid plus local anaesthetic
[15] Systematic review	228 people with unilateral sciatica, possibly caused by disc herniation Data from 1 RCT	Proportion of people with improvement in leg pain (unspecified) measured by VAS , 6 weeks with triamcinolone 80 mg plus 10 mL 0.25% bupivacaine with 2 mL normal saline Absolute results not reported	Reported as no significant difference between groups No further data reported by review	↔	Not significant
[15] Systematic review	228 people with unilateral sciatica, possibly caused by disc herniation Data from 1 RCT	Proportion of people with improvement in leg pain (unspecified) measured by Likert scale , 6 weeks with triamcinolone 80 mg plus 10 mL 0.25% bupivacaine with 2 mL normal saline Absolute results not reported	Reported as no significant difference between groups No further data reported by review	↔	Not significant

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
[15] Systematic review	158 people with sciatica caused by herniated nucleus pulposus Data from 1 RCT	Improvement in leg pain (unspecified) , 6 weeks with methylprednisolone acetate (80 mg and 8 mL of isotonic saline) with 1 mL isotonic saline Absolute results not reported Interlaminar epidural injection Greater improvement with methylprednisolone acetate (80 mg and 8 mL of isotonic saline) than with 1 mL isotonic saline	P = 0.03		corticosteroid
[15] Systematic review	158 people with sciatica caused by herniated nucleus pulposus Data from 1 RCT	Improvement in leg pain (unspecified) , 3 months with methylprednisolone acetate (80 mg and 8 mL of isotonic saline) with 1 mL isotonic saline Absolute results not reported Interlaminar epidural injection	Reported as no significant differences between groups No further data reported		Not significant
[15] Systematic review	51 people with lumbar root compression related to herniated lumbar disc documented by neurological deficit and abnormality noted on myelography Data from 1 RCT	Pain (unspecified) , 3 months with 80 mg methylprednisolone (2 mL) with 2 mL normal saline Absolute results not reported Interlaminar epidural injection (single injection)	Reported as no significant differences between groups No further data reported		Not significant
[15] Systematic review	51 people with lumbar root compression related to herniated lumbar disc documented by neurological deficit and abnormality noted on myelography Data from 1 RCT	Pain (unspecified) , 14 months with 80 mg methylprednisolone (2 mL) with 2 mL normal saline Absolute results not reported	Reported as no significant difference between groups No further data reported		Not significant
[17] RCT	85 people with sciatica caused by herniated disc In review [16]	Mean change in pain scores from baseline measured by unspecified VAS , 35 days –30.3 mm with epidural corticosteroid injections (2 mL prednisolone acetate at 2-day intervals for a total of 3 injections) –25.2 mm with placebo (2 mL isotonic saline injection)	Mean difference –5.1 95% CI –18.7 to +8.4		Not significant

No data from the following reference on this outcome. [13]

Functional improvement

Epidural corticosteroid injection (with or without local anaesthetic) compared with no epidural corticosteroid injection
Epidural corticosteroid injection (with or without local anaesthetic) may be no more effective in the longer term (over 5 weeks) at improving disability (as measured by the Roland Morris Disability Questionnaire and Oswestry Disability Index scores) or functional outcomes (e.g., straight leg raising and lumbar flexion) compared with no epidural corti-

costeroid injection in people with clinical symptoms of sciatica relating to confirmed or suspected lumbar disc herniation (**moderate-quality evidence**).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Functional improvement					
[17] RCT	85 people with sciatica caused by herniated disc In review [16]	Roland Morris Disability Questionnaire score (mean change from baseline) , 35 days –5.3 with epidural corticosteroid injections (2 mL prednisolone acetate at 2-day intervals for a total of 3 injections) –3.2 with placebo (2 mL isotonic saline injection)	ARR –2.1 95% CI –5.0 to +0.8	↔	Not significant
[15] Systematic review	228 people with unilateral sciatica, possibly caused by disc herniation Data from 1 RCT	Oswestry Disability Index , 3 weeks with triamcinolone 80 mg plus 10 mL 0.25% bupivacaine with 2 mL normal saline Absolute results not reported Interlaminar epidural injection Greater improvement with triamcinolone 80 mg plus 10 mL 0.25% bupivacaine than with 2 mL normal saline	Reported as significant difference; see Further information on studies P value not reported	○○○	corticosteroid plus local anaesthetic
[15] Systematic review	228 people with unilateral sciatica, possibly caused by disc herniation Data from 1 RCT	Oswestry Disability Index , 6 weeks with triamcinolone 80 mg plus 10 mL 0.25% bupivacaine with 2 mL normal saline Absolute results not reported Interlaminar epidural injection	Reported as no significant difference; see Further information on studies P value not reported	↔	Not significant
[15] Systematic review	158 people with sciatica due to herniated nucleus pulposus Data from 1 RCT	Oswestry Disability Index , 3 weeks with methylprednisolone acetate (80 mg and 8 mL of isotonic saline) with 1 mL isotonic saline Absolute results not reported Interlaminar epidural injection Slightly greater improvement with methylprednisolone acetate (80 mg and 8 mL of isotonic saline) than with isotonic saline 1 mL	Significance not assessed		
[15] Systematic review	158 people with sciatica due to herniated nucleus pulposus Data from 1 RCT	Oswestry Disability Index , 3 months with methylprednisolone acetate (80 mg and 8 mL of isotonic saline) with 1 mL isotonic saline Absolute results not reported	Reported as not significant No further data reported	↔	Not significant
[15] Systematic review	228 people with unilateral sciatica, possibly caused by disc herniation Data from 1 RCT	Oswestry Disability Index 75% improvement in scores , 52 weeks 32.5% with triamcinolone 80 mg plus 10 mL 0.25% bupivacaine	Significance not assessed; see Further information on studies		



Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
		29.6% with 2 mL normal saline Interlaminar epidural injection			

No data from the following reference on this outcome. ^[13] ^[14]

Patient perception of improvement

Epidural corticosteroid injection (with or without local anaesthetic) compared with no epidural corticosteroid injection

We don't know if epidural corticosteroid injections (with or without local anaesthetic) are more effective at increasing subjective global improvement and patient satisfaction compared with no epidural corticosteroid injections in people with clinical symptoms of sciatica relating to confirmed or suspected lumbar disc herniation ([low-quality evidence](#)).


Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Patient perception of improvement					
^[13] Systematic review	People with sciatica 4 RCTs in this analysis	Proportion of people with self-perceived global improvement (which was not defined) , 2–30 days 73/160 (46%) with epidural corticosteroid injections 56/172 (33%) with placebo 3 RCTs used methylprednisolone and 1 RCT used methylprednisolone acetate The volumes of the injection varied between studies from 2–10 mL	OR 2.2 95% CI 1.0 to 4.7		Not significant
^[17] RCT	85 people with sciatica caused by herniated disc In review ^[16]	People rating improvement as 'recovery' or 'marked improvement' , 35 days 21/43 (49%) with epidural corticosteroid injections (2 mL prednisolone acetate at 2-day intervals for a total of 3 injections) 20/42 (48%) with placebo (2 mL isotonic saline injection)	P = 0.91		Not significant

No data from the following reference on this outcome. ^[14] ^[15]

Need for surgery

Epidural corticosteroid injection (with or without local anaesthetic) compared with no epidural corticosteroid injection

We don't know if epidural corticosteroid injection is more effective at reducing the need for surgery over the subsequent 12 months following injection therapy compared with no epidural corticosteroid injection in people with sciatica caused by confirmed or suspected lumbar disc herniation ([very low-quality evidence](#)).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Need for surgery					
^[15] Systematic review	158 people with sciatica caused by herniated nucleus pulposus Data from 1 RCT	Proportion having back surgery , 12 months 26% with methylprednisolone acetate (80 mg and 8 mL of isotonic saline) 25% with 1 mL isotonic saline Absolute numbers not reported	Reported as not significant No further data reported		Not significant

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
		Interlaminar epidural injection			

No data from the following reference on this outcome. [\[13\]](#) [\[14\]](#) [\[17\]](#)

Quality of life

No data from the following reference on this outcome. [\[13\]](#) [\[14\]](#) [\[15\]](#) [\[17\]](#)

Adverse effects

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Adverse effects					
[13] Systematic review	People with sciatica 4 RCTs in this analysis	Adverse effects , 2–30 days with epidural corticosteroid injections with placebo Absolute results not reported 332 people included in this analysis No serious adverse effects were reported in the RCTs identified by the systematic review, although 26 people complained of transient headache or transient increase in sciatic pain			
[17] RCT	85 people with sciatica caused by herniated disc In review [16]	Clinically important adverse effects , 35 days 2/43 (5%) with epidural corticosteroid injections (2 mL prednisolone acetate at 2-day intervals for a total of 3 injections) 3/42 (7%) with placebo (2 mL isotonic saline injection) The RCT reported that headache occurred in 2 people in each group, and thoracic pain in 1 person with control	P = 0.68	↔	Not significant

No data from the following reference on this outcome. [\[14\]](#) [\[15\]](#)

Epidural corticosteroid injection (with or without local anaesthetic) plus conservative non-operative treatment versus conservative treatment alone:

We found one RCT. [\[18\]](#)

Pain

Epidural corticosteroid injection (with or without local anaesthetic) plus conservative non-operative treatment compared with conservative treatment alone Epidural corticosteroid injection with local anaesthetic plus conservative non-operative treatment may be no more effective at 6 weeks and 6 months at improving pain scores (location of pain un-

specified) compared with conservative treatment alone in people with clinical symptoms of sciatica relating to confirmed disc herniation. However, we only found one small RCT with 36 people ([low-quality evidence](#)).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Pain					
[18] RCT	36 people with radicular lumbosciatic pain and positive straight leg raising test; disc herniation confirmed by MRI	Pain scores (visual analogue scale: 0 = no pain, 100 = most pain possible) , 6 months 32.9 (range 0–85) with epidural corticosteroid injection (with local anaesthetic) plus conservative non-operative treatment 39.2 (range 0–100) with conservative treatment alone The corticosteroid group received three injections of methylprednisolone 100 mg in 10 mL 0.25% bupivacaine during the first 14 days in hospital Conservative treatment involved initial bed rest and analgesia followed by graded rehabilitation (including hydrotherapy, electroanalgesia, and postural exercise classes) followed by physiotherapy	P = 0.18 The RCT also found no significant difference at 6 weeks	↔	Not significant

Functional improvement

Epidural corticosteroid injection (with or without local anaesthetic) plus conservative non-operative treatment compared with conservative treatment alone Epidural corticosteroid injection with local anaesthetic plus conservative non-operative treatment may be no more effective at 6 months at improving mobility scores compared with conservative treatment alone in people with clinical symptoms of sciatica relating to confirmed disc herniation. However, we only found one small RCT with 36 people ([low-quality evidence](#)).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Functional improvement					
[18] RCT	36 people with radicular lumbosciatic pain and positive straight leg raising test; disc herniation confirmed by MRI	Hannover Functional Ability Questionnaire from 0% (lowest mobility) to 100% (highest mobility) , 6 months 61.8 (range 25–83) with epidural corticosteroid injection (with local anaesthetic) plus conservative non-operative treatment 57.2 (range 17–83) with conservative treatment alone The corticosteroid group received three injections of methylprednisolone 100 mg in 10 mL 0.25% bupivacaine during the first 14 days in hospital Conservative treatment involved initial bed rest and analgesia followed by graded rehabilitation (including hydrotherapy, electroanalgesia, and postural exercise classes) followed by physiotherapy	P = 0.15	↔	Not significant
[18] RCT	36 people with radicular lumbosciatic pain and positive straight leg raising test; disc	People returning to work , 6 months 15/17 (88%) with epidural corticosteroid injection (with local	RR 1.19 95% CI 0.75 to 1.33	↔	Not significant

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
	herniation confirmed by MRI	<p>anaesthetic) plus conservative non-operative treatment</p> <p>14/19 (74%) with conservative treatment alone</p> <p>The corticosteroid group received three injections of methylprednisolone 100 mg in 10 mL 0.25% bupivacaine during the first 14 days in hospital</p> <p>Conservative treatment involved initial bed rest and analgesia followed by graded rehabilitation (including hydrotherapy, electroanalgesia, and postural exercise classes) followed by physiotherapy</p>			

Patient perception of improvement

No data from the following reference on this outcome. ^[18]

Need for surgery

Epidural corticosteroid injection (with or without local anaesthetic) plus conservative non-operative treatment compared with conservative treatment alone Epidural corticosteroid injection with local anaesthetic plus conservative non-operative treatment may be no more effective at 6 months compared with conservative treatment alone at reducing the need for surgery in people with clinical symptoms of sciatica relating to confirmed disc herniation. However, we only found one small RCT with 36 people ([low-quality evidence](#)).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Need for surgery					
^[18] RCT	36 people with radicular lumbosacral pain and positive straight leg raising test; disc herniation confirmed by MRI	<p>Proportion of people needing back surgery , 6 months</p> <p>2/17 (12%) with epidural corticosteroid injection (with local anaesthetic) plus conservative non-operative treatment</p> <p>4/19 (21%) with conservative treatment alone</p> <p>The corticosteroid group received three injections of methylprednisolone 100 mg in 10 mL 0.25% bupivacaine during the first 14 days in hospital</p> <p>Conservative treatment involved initial bed rest and analgesia followed by graded rehabilitation (including hydrotherapy, electroanalgesia, and postural exercise classes) followed by physiotherapy</p>	<p>RR 0.56</p> <p>95% CI 0.09 to 2.17</p> <p>Contributors' own calculations</p> <p>Reported as not significant by original RCT</p>	↔	Not significant

Quality of life

No data from the following reference on this outcome. ^[18]

Adverse effects


No data from the following reference on this outcome. ^[18]

Epidural corticosteroid injection (with or without local anaesthetic) versus discectomy:

We found one systematic review (search date 2007, 1 RCT ^[19]) comparing epidural injections with surgery. ^[20]


Pain

Epidural corticosteroid injection (with or without local anaesthetic) compared with standard discectomy Epidural corticosteroid injections may be less effective at 1 to 3 months at improving leg pain compared with discectomy in people with clinical symptoms relating to confirmed lumbar disc herniation (*very low-quality evidence*).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Pain					
^[19] RCT	100 people with lumbar disc herniation >25% of cross-sectional area of spinal canal who had 6 weeks of unsuccessful, non-invasive treatment (physiotherapy, chiropractic treatment, rest, analgesia, or a combination) In review ^[20]	Difference in leg pain on 11-point visual analogue scale , 1–3 months with epidural corticosteroid injections (betamethasone 10–15 mg, 1 week apart up to 3 times until successful) with discectomy (no further details reported) Absolute results reported graphically	P = 0.001 The difference between treatments was not sustained at 2 to 3 years' follow-up (results presented graphically; see Further information on studies)		discectomy

Functional improvement

Epidural corticosteroid injection (with or without local anaesthetic) compared with standard discectomy Epidural corticosteroid injections may be less effective at 1 to 3 months at improving [Oswestry Disability Index](#) scores compared with discectomy in people with clinical symptoms relating to confirmed lumbar disc herniation (*very low-quality evidence*).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Functional improvement					
^[19] RCT	100 people with lumbar disc herniation >25% cross-sectional area of spinal canal who had 6 weeks of unsuccessful, non-invasive treatment (physiotherapy, chiropractic treatment, rest, analgesia, or a combination) In review ^[20]	Oswestry Disability Index score , 1–3 months with epidural corticosteroid injections (betamethasone 10–15 mg, 1 week apart up to 3 times until successful) with discectomy (no further details reported) Absolute results reported graphically	P = 0.015 The difference between treatments was not sustained at 2 to 3 years' follow-up (results presented graphically; see Further information on studies)		discectomy

Patient perception of improvement

No data from the following reference on this outcome. ^[19]


Need for surgery

No data from the following reference on this outcome. ^[19]

Quality of life

No data from the following reference on this outcome. ^[19]

Adverse effects

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Adverse effects					
^[19] RCT	100 people with lumbar disc herniation >25% cross-sectional area of spinal canal who had 6 weeks of unsuccessful, non-invasive treatment (physiotherapy, chiropractic treatment, rest, analgesia, or a combination) In review ^[20]	Adverse effects , 1–3 months with epidural corticosteroid injections (betamethasone 10–15 mg, 1 week apart up to 3 times until successful) with discectomy (no further details reported) Absolute results reported graphically	The RCT found that 2/50 (4%) people in the epidural group had an incidental dural puncture and 3/50 (6%) people had recurrent disc herniation for 2 to 3 years' follow-up period		discectomy

Further information on studies

^[14] The additional RCT also reported a significant improvement in straight leg raise at both 4 weeks and 12 months.

^[15] This systematic review reports on a double-blinded RCT with 228 participants, in which the treatment group received an epidural injection of triamcinolone 80 mg plus 10 mL 0.25% bupivacaine and the placebo group received an epidural injection of normal saline. The RCT found that, by 6 weeks, the benefits of epidural corticosteroids were lost; and at 52 weeks, improvement in symptoms was 33% in the treatment group and 30% in the placebo group, an improvement that the authors of the systematic review conclude was probably related to the natural course of the disease.

^[19] The RCT allowed the 27 people in whom the epidural had failed to improve their symptoms (self-assessment) to receive discectomy. This group was analysed as failures for the epidural corticosteroid injections, and also as a separate subgroup. Two further people in each group who completely crossed over to receive other treatment were analysed according to the intervention they received. There seemed to be multiple hypothesis tests without mention of adjusting the analysis to account for this. Also, no attempt was made to blind the measurement of outcomes. These results should, therefore, be interpreted with caution.

Comment:

Clinical guide

In the context of quality of life and pain-relieving treatment for an individual patient, there is no need for a strong recommendation for one treatment or another from the supervising clinician and, in fact, such advice would now be considered inappropriate. It is critical that patients are fully informed

of their choices and available options. In relation to these injections, it would be reasonable to advise patients that they may offer some short-term relief but with no strong evidence of a long-term advantage over sham injections. Patients should understand that these may be pain-relieving injections that wear off and that they may still need surgery; although, a significant number of patients will have seen resolution of the disc herniation during the time when the pain is being helped by the epidural. Patients should have these options discussed with them so that they are fully informed to make a free patient choice.

OPTION	EPIDURAL INJECTION WITH LOCAL ANAESTHETIC ALONE	New
<ul style="list-style-type: none"> For GRADE evaluation of interventions for Herniated lumbar disc: injection interventions for sciatica, see table, p 21. We found no direct information from RCTs about epidural injection with local anaesthetic alone in the treatment of people with clinical symptoms of sciatica relating to confirmed or suspected herniated lumbar disc. 		

Benefits and harms

Epidural injection with local anaesthetic alone:

We found no systematic review or RCTs on the use of local anaesthetic given as an epidural injection for treatment of people with symptomatic herniated lumbar disc.

Comment: There is no evidence supporting either local anaesthetic alone or local anaesthetic with corticosteroid as being the better option, and this treatment selection must be a matter of informed patient choice. A significant part of pain generation in disc herniation relates to inflammation, and there may be a treatment effect from the corticosteroid part of the injection.

Clinical guide

Use of corticosteroids would generally be a matter of clinician preference and informed patient choice. Some patients have had previous adverse reactions to corticosteroid injection. Patients who have been on long-term corticosteroid therapy or have hypothalamic pituitary axis disease may see more systemic effects from this type of local corticosteroid injection and, in general terms, may be better advised to have the local anaesthetic alone.

OPTION	NERVE ROOT BLOCK WITH CORTICOSTEROID INJECTION (WITH OR WITHOUT LOCAL ANAESTHETIC)	New
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- For GRADE evaluation of interventions for Herniated lumbar disc: injection interventions for sciatica, [see table, p 21](#).
- We don't know whether injection of corticosteroid as a nerve block, with or without local anaesthetic, is more effective than no nerve block at improving pain or need for surgery in people with clinical symptoms of sciatica relating to confirmed herniated lumbar disc.

Benefits and harms

Nerve root block with corticosteroid injection (with or without local anaesthetic) versus no nerve root block corticosteroid injection:

We found three systematic reviews (search dates 2003; ^[21] 2013; ^[22] and search date not reported ^[23]). None of the reviews reported a meta-analysis, with the authors of two of the reviews indicating that studies were too heterogeneous for the data to be synthesised. ^[21] ^[22] Between them, the reviews identified three RCTs meeting *BMJ Clinical Evidence* inclusion criteria. We have reported two of these from the systematic review, and one from the original reporting in the RCT, ^[24] as this included further detail of interest.

Pain

Nerve root block with corticosteroid injection (with or without local anaesthetic) compared with no nerve root block corticosteroid injection We don't know whether injection of corticosteroid as a nerve block, with or without local anaesthetic, is more effective than no nerve block at improving pain in people with clinical symptoms of sciatica relating to confirmed herniated lumbar disc ([low-quality evidence](#)).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Pain					
[21] Systematic review	49 people with 'intractable sciatica' radiologically confirmed disc herniation Data from 1 RCT See Further information on studies	Proportion of people with symptom relief , 3 months 54% with triamcinolone plus saline interlaminar perineural injection 40% with placebo (saline) interlaminar perineural injection Absolute numbers not reported Placebo group also received triamcinolone 10 mg intramuscularly concurrently to account for systemic corticosteroid effect	Significance not assessed Randomisation method not reported		
[21] Systematic review	160 people with lower-limb pain caused by radiologically confirmed disc herniation Data from 1 RCT	Proportion of people with symptom relief , 12 months 65% with corticosteroid injection 65% with saline placebo injection Absolute numbers not reported	Reported as not significant P value not reported	↔	Not significant
[24] RCT 5-armed trial	150 people with lumbar radicular pain and with disc herniation confirmed by computed tomography or magnetic resonance imaging In review [22]	Change from baseline in mean leg pain score (assessed using an 11-point scale from 0 to 10, where lower score is favourable) , 1 month From 7.0 to 4.1 with triamcinolone plus 0.5% bupivacaine From 6.6 to 5.5 with normal saline 65 people in this analysis The remaining arms evaluated transforaminal injection of local anaesthetic, intramuscular injection of corticosteroid, and intramuscular injection of normal saline	P = 0.71 See Further information on studies	↔	Not significant
[24] RCT 5-armed trial	150 people with lumbar radicular pain and with disc herniation confirmed by computed tomography or magnetic resonance imaging In review [22]	Proportion of patients with a successful outcome (at least a 50% reduction in pain) , 1 month 15/28 (54%) with triamcinolone plus 0.5% bupivacaine 7/37 (19%) with normal saline 65 people in this analysis The remaining arms evaluated transforaminal injection of local anaesthetic, intramuscular injection of corticosteroid, and intramuscular injection of normal saline	Difference between groups reported to be significant P value not reported	○○○	corticosteroid plus local anaesthetic

No data from the following reference on this outcome. [23]

Functional improvement

No data from the following reference on this outcome. [21] [22] [23] [24]

Patient perception of improvement

No data from the following reference on this outcome. [\[21\]](#) [\[22\]](#) [\[23\]](#) [\[24\]](#)

Need for surgery

Nerve root block with corticosteroid injection (with or without local anaesthetic) compared with no nerve root block corticosteroid injection We don't know whether corticosteroid injection given as a nerve block, with or without local anaesthetic, is more effective than no nerve block at reducing the need for surgery in people with clinical symptoms of sciatica relating to confirmed herniated lumbar disc ([low-quality evidence](#)).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Need for surgery					
[24] RCT 5-armed trial	150 people with lumbar radicular pain and with disc herniation confirmed by computed tomography or magnetic resonance imaging In review [22]	Proportion of people electing to undergo surgery (as a result of either no benefit from initial treatment or need for rescue treatment) 10/28 (36%) with triamcinolone plus 0.5% bupivacaine 10/37 (27%) with normal saline The remaining arms evaluated transforaminal injection of local anaesthetic, intramuscular injection of corticosteroid, and intramuscular injection of normal saline	Significance not assessed		

No data from the following reference on this outcome. [\[21\]](#) [\[23\]](#)

Quality of life

No data from the following reference on this outcome. [\[21\]](#) [\[22\]](#) [\[23\]](#) [\[24\]](#)

Adverse effects

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Adverse effects					
[21] Systematic review	People 2 RCTs in this analysis	Adverse effects with corticosteroid nerve block injection with placebo injection 209 people included in this analysis The review noted a 1.9% incidence of headache with nerve block injection in one RCT, and a retroperitoneal haematoma in 1 person having concurrent anticoagulation treatment in the other RCT			

Herniated lumbar disc: injection interventions for sciatica

No data from the following reference on this outcome. ^[22] ^[23] ^[24]

Further information on studies

- ^[21] One RCT included in this review included 49 people with radiologically confirmed disc herniation and 'intractable sciatica'. Further definition of the pain is reported in the RCT as, "root pain exemplified by unilateral sciatica extending below the knee and associated with paraesthesia and tension signs in the form of a positive straight leg raise". The predominant symptom prior to injection was leg pain rather than back pain.
- ^[24] *Statistical assessment* It is unclear whether the reported P value for the change from baseline in mean leg pain score at 1 month is for the difference between groups in final score at 1 month or change in mean score from baseline to 1 month.

Comment: None.

OPTION	NERVE ROOT BLOCK WITH LOCAL ANAESTHETIC ALONE	New
<ul style="list-style-type: none"> For GRADE evaluation of interventions for Herniated lumbar disc: injection interventions for sciatica, see table, p 21. We don't know whether nerve root block with local anaesthetic alone is more effective than no nerve root block at improving pain outcomes or need for surgery in people with lumbar radicular pain (sciatica) and with disc herniation confirmed by computed tomography or magnetic resonance imaging. We only found one RCT evaluating this intervention. 		

Benefits and harms

Nerve block with local anaesthetic versus no nerve block:

We found one RCT. ^[24]

Pain

Nerve root block with local anaesthetic alone compared with no nerve root block We don't know whether nerve root block with local anaesthetic alone is more effective than no nerve root block at improving pain outcomes in people with lumbar radicular pain (sciatica) and with disc herniation confirmed by computed tomography or magnetic resonance imaging ([low-quality evidence](#)).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Pain					
^[24] RCT 5-armed trial	150 people with lumbar radicular pain and with disc herniation confirmed by computed tomography or magnetic resonance imaging	<p>Change from baseline in mean leg pain score (assessed using an 11-point scale from 0 to 10, where lower score is favourable), 1 month</p> <p>From 7.4 to 6.7 with 0.5% bupivacaine</p> <p>From 6.6 to 5.5 with normal saline</p> <p>64 people in this analysis</p> <p>The remaining arms evaluated transforaminal injection of corticosteroid plus local anaesthetic, intramuscular injection of corticosteroid, and intramuscular injection of normal saline</p>	<p>P = 0.70</p> <p>See Further information on studies</p>	↔	Not significant

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
[24] RCT 5-armed trial	150 people with lumbar radicular pain and with disc herniation confirmed by computed tomography or magnetic resonance imaging	Proportion of patients with a successful outcome (at least a 50% reduction in pain) , 1 month 2/27 (7%) with 0.5% bupivacaine 7/37 (19%) with normal saline 64 people in this analysis The remaining arms evaluated transforaminal injection of corticosteroid plus local anaesthetic, intramuscular injection of corticosteroid, and intramuscular injection of normal saline	Difference between groups reported to be non-significant P value not reported	↔	Not significant

Functional improvement

No data from the following reference on this outcome. [24]

Patient perception of improvement

No data from the following reference on this outcome. [24]

Need for surgery

Nerve root block with local anaesthetic alone compared with no nerve root block We don't know whether nerve root block with local anaesthetic alone is more effective than no nerve root block at reducing need for surgery in people with lumbar radicular pain (sciatica) and with disc herniation confirmed by computed tomography or magnetic resonance imaging (**low-quality evidence**).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Need for surgery					
[24] RCT 5-armed trial	150 people with lumbar radicular pain and with disc herniation confirmed by computed tomography or magnetic resonance imaging	Proportion of people electing to undergo surgery (as a result of either no benefit from initial treatment or need for rescue treatment) 7/27 (26%) with 0.5% bupivacaine 10/37 (27%) with normal saline The remaining arms evaluated transforaminal injection of corticosteroid plus local anaesthetic, intramuscular injection of corticosteroid, and intramuscular injection of normal saline	Significance not assessed		

Quality of life

No data from the following reference on this outcome. [24]

Adverse effects

No data from the following reference on this outcome. ^[24]

Further information on studies

^[24] *Statistical assessment* It is unclear whether the reported P value for the outcome change from baseline in mean leg pain score at 1 month is for the difference between groups in final score at 1 month or change in mean score from baseline to 1 month.

Comment: None.

GLOSSARY

Cauda equina syndrome Compression of the cauda equina, causing symptoms that include changes in perineal sensation (saddle anaesthesia) and loss of sphincter control. The cauda equina is a collection of spinal roots descending from the lower part of the spinal cord, which occupy the vertebral canal below the spinal cord.

Likert Scale A method of measuring attitudes that asks respondents to indicate their degree of agreement or disagreement with statements, according to a scoring system (usually 5 points). For example, subjects may be asked to rate their pain on a scale where none = 0, mild = 1, moderate = 2, severe = 3, and extreme = 4.

Low-quality evidence Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Moderate-quality evidence Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Oswestry Disability Index Back-specific, self-reported questionnaire measuring pain and function in completing physical and social activities. The scale score ranges from 0 (no disability) to 100 (maximum disability).

Roland Morris Disability Questionnaire A 24-item, self-reported, disability scale specific to back pain recommended for use in primary care and community studies. Measures daily function in completing activities affected by back pain. The scale score ranges from 0 (no disability) to 24 (severe disability).

Very low-quality evidence Any estimate of effect is very uncertain.

SUBSTANTIVE CHANGES

Epidural injection with local anaesthetic alone New option. No evidence found. Categorised as 'unknown effectiveness'.

Nerve root block with corticosteroid injection (with or without local anaesthetic) New option. Three systematic reviews found. ^[21] ^[22] ^[23] Categorised as 'unknown effectiveness'.

Nerve root block with local anaesthetic alone New option. One RCT found. ^[24] Categorised as 'unknown effectiveness'.

Epidural corticosteroid injection (with or without local anaesthetic) One new systematic review added. ^[16] Categorisation unchanged (unknown effectiveness).

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GRADE Evaluation of interventions for Herniated lumbar disc: injection interventions for sciatica.

Important outcomes	Functional improvement, Need for surgery, Pain, Patient perception of improvement, Quality of life									
	Studies (Participants)	Outcome	Comparison	Type of evidence	Quality	Consistency	Directness	Effect size	GRADE	Comment
What are the effects of injection interventions for clinical symptoms of sciatica relating to confirmed or suspected herniated lumbar disc?										
5 (545) ^{[14] [15] [17]}	Pain	Epidural corticosteroid injection (with or without local anaesthetic) versus no epidural corticosteroid injection	4	−1	−1	0	0	Low	Quality point deducted for incomplete reporting of results; consistency point deducted for different results at different end points	
3 (471) ^{[15] [17]}	Functional improvement	Epidural corticosteroid injection (with or without local anaesthetic) versus no epidural corticosteroid injection	4	−1	0	0	0	Moderate	Quality point deducted for incomplete reporting of results	
5 (417) ^{[13] [17]}	Patient perception of improvement	Epidural corticosteroid injection (with or without local anaesthetic) versus no epidural corticosteroid injection	4	0	−1	−1	0	Low	Consistency point deducted for different results at different end points; directness point deducted for not defining outcome measured	
1 (158) ^[15]	Need for surgery	Epidural corticosteroid injection (with or without local anaesthetic) versus no epidural corticosteroid injection	4	−2	0	−1	0	Very low	Quality point deducted for sparse data and incomplete reporting of results; directness point deducted for narrow included population	
1 (36) ^[18]	Pain	Epidural corticosteroid injection (with or without local anaesthetic) plus conservative non-operative treatment versus conservative treatment alone	4	−1	0	−1	0	Low	Quality point deducted for sparse data; directness point deducted for wide range of interventions used in comparison, making the results difficult to apply in clinical practice	
1 (36) ^[18]	Functional improvement	Epidural corticosteroid injection (with or without local anaesthetic) plus conservative non-operative treatment versus conservative treatment alone	4	−1	0	−1	0	Low	Quality point deducted for sparse data; directness point deducted for wide range of interventions used in comparison, making the results difficult to apply in clinical practice	
1 (36) ^[18]	Need for surgery	Epidural corticosteroid injection (with or without local anaesthetic) plus conservative non-operative treatment versus conservative treatment alone	4	−1	0	−1	0	Low	Quality point deducted for sparse data; directness point deducted for wide range of interventions used in comparison, making the results difficult to apply in clinical practice	
1 (100) ^[19]	Pain	Epidural corticosteroid injection (with or without local anaesthetic) versus discectomy	4	−2	−1	0	0	Very low	Quality points deducted for sparse data and incomplete reporting of results; consistency point deducted for different results at different end points	
1 (100) ^[19]	Functional improvement	Epidural corticosteroid injection (with or without local anaesthetic) versus discectomy	4	−2	−1	0	0	Very low	Quality points deducted for sparse data and incomplete reporting of results; consistency point deducted for different results at different end points	
3 (274) ^{[21] [24]}	Pain	Nerve root block with corticosteroid injection (with or without local anaesthetic) versus no nerve root block corticosteroid injection	4	−2	0	0	0	Low	Quality points deducted for incomplete reporting of results and methodological flaws (unclear method of randomisation in one RCT)	

Important outcomes		Functional improvement, Need for surgery, Pain, Patient perception of improvement, Quality of life							
Studies (Participants)	Outcome	Comparison	Type of evidence	Quality	Consistency	Directness	Effect size	GRADE	Comment
1 (65) ^[24]	Need for surgery	Nerve root block with corticosteroid injection (with or without local anaesthetic) versus no nerve root block corticosteroid injection	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (64) ^[24]	Pain	Nerve block with local anaesthetic versus no nerve block	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (64) ^[24]	Need for surgery	Nerve block with local anaesthetic versus no nerve block	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results

We initially allocate 4 points to evidence from RCTs, and 2 points to evidence from observational studies. To attain the final GRADE score for a given comparison, points are deducted or added from this initial score based on preset criteria relating to the categories of quality, directness, consistency, and effect size. Quality: based on issues affecting methodological rigour (e.g., incomplete reporting of results, quasi-randomisation, sparse data [<200 people in the analysis]). Consistency: based on similarity of results across studies. Directness: based on generalisability of population or outcomes. Effect size: based on magnitude of effect as measured by statistics such as relative risk, odds ratio, or hazard ratio.